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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/892,789	06/28/2001	Hyo-Jin Kim	053785-5022	9633

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EXAMINER

DI GRAZIO, JEANNE A

ART UNIT PAPER NUMBER

2871

DATE MAILED: 02/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/892,789

Applicant(s)

KIM, HYO-JIN

Examiner

Jeanne A. Di Grazio

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE 12/8/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-15,17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-15,17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims

Claims 1, 3-15 and 17-18 are pending. Claim 16 has previously been cancelled. Claims 2 and 19-20 have been cancelled per Amendment of May 25, 2005. Claims 1, 3, 4 and 15 have been amended per Amendment of November 10, 2005.

Priority

Priority to Korean Patent Application No. 2000-51876 (Sept. 2, 2000) is claimed.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 8, 2005 has been entered.

Claim Objections

Claims 1, 10 and 15 are objected to because of the following informalities:

As to claims 1, 10 and 15, it is noted that all components of a display device are essentially removable – either by a user of the device or a technician during repair of a device. Removability depends on the degree of removability – whether the component is to be removed by a user of the device or whether the component is to be removed by a technician during repair of the device. Removability of the printed circuit boards is presumed to be met by the prior art of record.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-8, 11-15 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 6,307,530 B1 (to Cho) in view of United States Patent 4,772,100 (to Suenaga).

As to claims 1 (amended), 3-8, 11, 15 (amended) and 17-18, Cho teaches and discloses a liquid crystal display having a partitioned circuit section (Title, entire patent). With reference to Figure 1, Cho illustrates a liquid crystal panel (1) that necessarily includes upper and lower

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substrates and a liquid crystal layer interposed between the upper and lower substrates, a rear case (2)(Applicant's first frame) onto which a main printed circuit board (11)(Applicant's source printed circuit board) and a power printed circuit board (12 and 13)(Applicant's control printed circuit board) are disposed and printed circuit boards (11), (12), and (13) are laterally spaced apart from each other along a horizontal direction as per Figure 1, a front case (3)(Applicant's second frame) coupled with the rear case (2)(Applicant's first frame) such that the liquid crystal panel (1) is fixed between the rear case (2) and the front case (3), wherein the main printed circuit board (11) is mounted on the rear case (2) and is electrically connected with the liquid crystal panel (interface board, 10), and the power printed circuit board (12 and 13) is electrically connected to the main printed circuit board (11) to drive the liquid crystal panel (connect cables, 17).

Cho teaches and discloses connection structures on the rear case (2)(screws and bolts, for example) that are used to affix the printed circuit boards (11, 12, 13) and liquid crystal panel (1) to the inside of the rear case (2). The circuit boards have notches (Figures 1 and 3 for example).

Please also note that Cho, Figure 1, illustrates that the first frame (2) has at least one coupling segment (several coupling segments may be seen on the inner surface of the first frame (2)) to hold, respectively, a side and an opposite side of the control printed circuit board (12 and 13). Upon assembly of the entire device, the first frame necessarily holds sides of the printed circuit boards.

Although Cho Figure 3, illustrates connect cables (17) connecting printed circuit boards 11 and 12, Cho does not appear to explicitly specify that the main printed circuit board is removable from the power printed circuit board and the rear case.

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Suenaga teaches and discloses a liquid crystal display device having circuit boards extending along segment and column electrode directions (Title, entire patent). Suenaga teaches and discloses, with reference to Figure 5A, by way of non-limiting example, a plan view of a printed circuit board assembly forming part of a liquid crystal display device. Suenaga illustrates a printed circuit board assembly (3) with at least segment circuit boards (3A and 3B) and common circuit board (3C) arranged on a frame structure and laterally spaced apart from each other along a horizontal direction as per Figure 5A. Suenaga goes on to teach and disclose that when a defect is found during inspection in one of the printed circuit boards, it is only necessary to replace the particular printed circuit board having been found defective (Column 4, Lines 57-60) and thus repair and replacement of a defective printed circuit board can be readily accomplished.

As to Applicant's limitation "and the control printed circuit board and the liquid crystal panel are disposed on opposite sides of the first frame", it appears to the Examiner that Suenaga shows this feature in Figure 1:

A liquid crystal panel (item 2) is placed between a printed circuit board assembly (collectively item 3) and frame (item 1).

Suenaga is evidence that ordinary workers in the field of liquid crystal display modules would have had the reason, suggestion, and motivation to remove printed circuit boards from each other and from a frame for effective repair and replacement of defective printed circuit boards.

Therefore, it would have been obvious to one of ordinary skill in the art of liquid crystal display modules at the time the invention was made to modify Cho in view of Suenaga for effective repair and replacement of defective printed circuit boards.

Thus, claims 1 and 15 is rejected.

As to claims 3-8, 11 and 17-18, Cho teaches and discloses connection structures on the rear case (2)(screws and bolts, for example) that are used to affix the printed circuit boards (11, 12, 13) and liquid crystal panel (1) to the inside of the rear case (2). The circuit boards have notches (Figures 1 and 3 for example).

It would have been obvious to one of ordinary skill in the art of liquid crystal display modules at the time the invention was made to include attaching means on the inside of a frame to affix printed circuit boards and liquid crystal display panel to the inside of the frame to prevent the printed circuit boards and liquid crystal display panel from disconnection.

Thus, claims 3-8, 11 and 17-18 are rejected.

As to claim 12, Suenaga teaches and discloses an illuminating device (Figure 4, item 19) that is used as a backlight for illuminating the effective display area of the liquid crystal panel and that is disposed at the back of a printed circuit board assembly (Column 3, Lines 64-68 and Column 4, Lines 1-11).

Thus, claim 12 is rejected.

As to claims 13 and 14, Suenaga teaches and discloses several supports (Figure 1) in a completed liquid crystal display device (Figure 1).

Thus, claims 13 and 14 are rejected.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent 6,307,530 B1 (to Cho) in view of United States Patent 4,772,100 (to Suenaga) and further in view of United States Patent 5,963,287 (to Asada et al.).

As to claims 9 and 10, Cho does not appear to explicitly specify a flexible printed circuit board to electrically connect main printed circuit board and power printed circuit board and that the flexible printed circuit board is removable from the power printed circuit board.

Asada teaches and discloses a display unit with flexible printed circuit board (Title, entire patent). Asada teaches and discloses that a flexible printed circuit board is electrically connected to a driver circuit board and contributes to a display unit that can be manufactured inexpensively and at a high yield (Column 3, Lines 35-49).

Please furthermore note that all components of a display device are essentially removable – either by a user of the device or a technician during repair of a device. Removability depends on the degree of removability – whether the component is to be removed by a user of the device or whether the component is to be removed by a technician during repair of the device.

Asada is evidence that ordinary workers in the field of liquid crystal display modules would have had the reason, suggestion, and motivation to have a flexible printed circuit board electrically connecting the main printed circuit board and power printed circuit board and that the flexible printed circuit board is removable from the power printed circuit board to contribute to a display unit that can be manufactured inexpensively and at a high yield.

Therefore it would have been obvious to one of ordinary skill in the art of liquid crystal display modules at the time the invention was made to modify Cho in view of Asada for a

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display unit that can be manufactured inexpensively and at a high yield as taught and disclosed in Asada.

Thus, claims 9 and 10 are rejected.

Response to Arguments

Applicant's arguments with respect to said claims have been considered but are moot in view of the new ground(s) of rejection.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (571)272-2289.

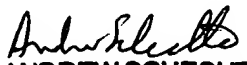
The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (571)272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jeanne Andrea Di Grazio
Patent Examiner
Art Unit 2871

JDG


ANDREW SCHECHTER
PRIMARY EXAMINER